RESULTS OF OPERATIVE TREATMENT OF PROTRUDED AND RUPTURED LUMBAR DISCS

BASED ON 1176 OPERATIVE CASES WITH 82 PER CENT FOLLOW-UP OF 3 TO 13 YEARS*

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In a previous paper, an analysis was made of the age and sex incidence, etiology, symptoms, physical signs, myelographic and laboratory findings in a series of 1176 cases of protruded and ruptured lumbar discs in a 10-year period from September 1946 to 1956 inclusive. In the present paper, operative data and results of operation and re-operation will be analyzed. Similar analyses have been made by O'Connell, Spurling, and Raaf.

Male patients in this group represented 63.5 per cent. In the entire series, there were only 13 patients under the age of 21, the youngest being 17 years of age. A little over 65 per cent of the group were between the ages of 31 and 50. History of trauma was noted only in 35 per cent of the patients.

The physical findings were not uniform. In only 40 per cent was some form of sensory abnormality noted. Decrease or loss of Achilles' jerk was present not only with rupture of L5-S1 discs but also in some cases of L4-L5 lesions as well as with many other combinations of discal protrusions. Patellar reflex was decreased or lost with involvement of the L3-L4 interspace, but in a few instances there was abnormality of this reflex also with L5-S1 as well as L4-L5 and L2-L3 lesions. Weakness of dorsiflexion of the big toe occurred most frequently with L4-L5 discal lesions but it was also found with L5-S1 protrusions and in instances of L4-L5 and L5-S1 lesions. Even when foot drop was present, it was not always associated with a lesion of a single interspace or the same interspace.

Because of these discrepancies in the neurological findings, and, in a certain number, because the abnormal neurological findings were minimal or absent, myelography was utilized in all patients. On comparing the myelographic findings with operative findings, it was found that there was an accuracy of 84.6 per cent with lesions at L4-L5. At the same level, a false-negative result of 8.4 per cent was noted. At the level of L5-S1, in 64.1 per cent there was myelographic and operative agreement. In 27.7 per cent, there were false-negative and in 8.2 per cent there were false-positive results at this level. When protrusions or ruptures were found at both the 4th and 5th interspaces, myelographic studies in this group showed 39.9 per cent positive results at both levels, 52.1 per cent at L4 interspace and 3.6 per cent positive at L5 interspace only. Need for exploring both the 4th and 5th interspaces whenever protrusion of a disc was suspected at L4 is obvious on the basis of the above statements.

We have always utilized myelographic studies because in the absence of definite neurological abnormalities, a normal myelogram has been used as an argument in favor of conservative therapy. It is our belief that this attitude has kept us from exploring many patients whose complaints could be

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nervous in origin who otherwise may have been operated upon with very poor results. In the presence of definite neurological abnormalities we feel that myelographic studies are desirable since they not only localize the areas of involvement more accurately, but occasionally demonstrate unsuspected lesions at different levels.

TECHNICAL CONSIDERATIONS

In the great majority of cases a hemilaminectomy was performed. This is done with the patient in a prone, semiflexed position on the operating table. A soft pillow is placed under both anterior iliac spines, and also under each pectoral region, to obtain some flexion of the spine and at the same time leave the diaphragm free to move. The knees are flexed and the feet are supported by another pillow. A vertical midline incision is made over the lower two or three lumbar spinous processes, and extended to the lumbodorsal fascia. The fascia is incised toward the side of the intended exposure, and the paravertebral muscles are stripped from the spinous processes and laminae by using a periosteal elevator or chisel.

When two or more interspaces were exposed, small windows were made in the bony coverings of the spinal canal overlying the interspace and the intervening bar or bars of bone were left intact. In a few instances, because of the crowding of the bony structures, the hemilaminectomy involved two consecutive interspaces with no intervening bone left between.

Exposure of the interspace laterally and inferiorly is extremely important. Particularly when there are adhesions about the outgoing root, inadequate lateral exposure may result in a torn dural lining overlying the root. In so far as possible, no shelf of bone should be left in the lateral boundary of the opening of the hemilaminectomy. In some cases, the medial facet may be injured. If so, it is excised in its entirety. If the dura mater over the root or subarachnoid space is torn inadvertently it is repaired, if necessary, by exposing the dural lining with a more extensive laminectomy. Gelfoam or muscle does not control a dural-arachnoid tear adequately. Such a tear, if not repaired, may result in a large internal meningocele. We have had to repair a few such tears.

When the epidural space contains many veins, electrocautery may be used with care. The wound should be irrigated with cool saline as soon as the vessels have been cauterized. Of course, the bleeding vessels should be separated carefully from the outgoing root before the application of the electrical current. Occasionally there may be some bleeding under the lateral shelf of the hemilaminectomy opening. If so, a blunt hook may be used to compress the vessel while the cautery current is applied to the conducting hook. We feel that traction on the dura mater and root with retractors is more dangerous than the careful use of electrocautery in the interspace in causing motor or sensory deficits.

Occasionally, a ruptured disc may protrude between the outgoing root and the dural sac. It is important to recognize this situation because when it occurs bleeding usually is more abundant and there is the possibility of injury to the nerve root if the anatomical relationships are not recognized. After removal of the larger portion of the discal material from the axilla, the nerve may be sufficiently relaxed so that access to any protruding areas lateral to the outgoing root is much easier.

The canal of the root is exposed by lateral and inferior exposure of the interspace operated upon. At times, ruptured discal material is tucked away in the vicinity of the outgoing root half an inch or more inferior and lateral to the interspace. In removing a soft, boggy mass, a presenting fibrous filament may point to a remaining mass of 1 to 4 gm. of sequestrated discal material tucked away in this area. Frequently, this may be teased out in its entirety and removed in one piece.

At times the ruptured discal material is half an inch or more below the interspace. In such a case, after removal of the ruptured material, the interspace is also inspected. A small rent in the annulus is seen frequently,